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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,770

11/17/2004

Robert Amin

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BUCHANAN, INGERSOLL & ROONEY PC
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EXAMINER

DOERRLER, WILLIAM CHARLES

ART UNIT

PAPER NUMBER

3744

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/501,770

Applicant(s)

AMIN ET AL.

Examiner

William C. Doerrler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35-54 is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7-19-2004, 4-27-2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement filed 7-19-2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. The US references have been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,3,5 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Dickey et al.

Dickey et al show a system for removing carbon dioxide from natural gas by expanding a compressed stream to produce cooling (12) to form a slurry of solid carbon dioxide particles in a liquefied natural gas. The slurry is passed to separation unit 26, with liquid natural gas being supplied through line 12 back to the cooling chamber.

Claims 1,3,4,13,14,16,17,22,23,32 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Wilding et al '409.

Wilding et al '409 discloses a system for removing carbon dioxide from a natural gas stream by forming a slurry of solid carbon dioxide in liquid carbon dioxide and then removing the solid particles in a separator.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2,8-12,21,30 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Wilding et al '409 or Dickey et al in view of Strong et al. Wilding et al '409 and Dickey et al each disclose applicant's basic inventive concept, a system for separating carbon dioxide from a natural gas stream by forming a slurry of solid carbon dioxide and liquid natural gas and separating the solids, substantially as claimed with the exception of stirring the fluid in the cooling chamber. Strong et al show this feature to be old in the slurry forming art, with lines 34-54 of column 3 stating that tangential flow for liquid injected into the chamber or a mechanical stirrer may be used. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Strong et al to modify the slurry forming structure of either Wilding et al or Dickey et al by forming a liquid inlet to provide a stirring motion or to provide a mechanical stirrer, to form a slurry which is pumpable and to reduce the chance of clogging a system pipe. In regard to claim 2, applicants state in the specification that stirring the fluid forms a colder temperature at the center of the cooling chamber. Because of this, the stirring means of Strong is seen to inherently form a colder temperature at the center of the cooling chamber. In regard to claims 12 and 31, Dickey et al shows the recycling of separated liquid within the cooling chamber.

Claims 6,7,18,19,20,24-26 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilding et al '409 in view of Engdahl. Wilding et al discloses applicants' basic inventive concept, a carbon dioxide separation system which forms a slurry of carbon dioxide and natural gas and then separates the solids out of the slurry, substantially as claimed with the exception of liquefying the

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carbon dioxide by keeping the slurry below the triple point of carbon dioxide. Engdahl shows this feature to be old in the carbon dioxide separation art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Engdahl to modify the slurry producing equipment of Wilding et al by liquefying the carbon dioxide to efficiently provide a source of liquid carbon dioxide that can economically be transported.

Allowable Subject Matter

Claims 35-54 are allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Selcukoglu et al shows a slurry forming separation system. Chitnis et al show a separator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


William C Doerrler
Primary Examiner
Art Unit 3744

WCD